

Campsite Monitoring in Kenai Fjords National Park

*Protocol Development, Current Conditions
and Recent Trends*

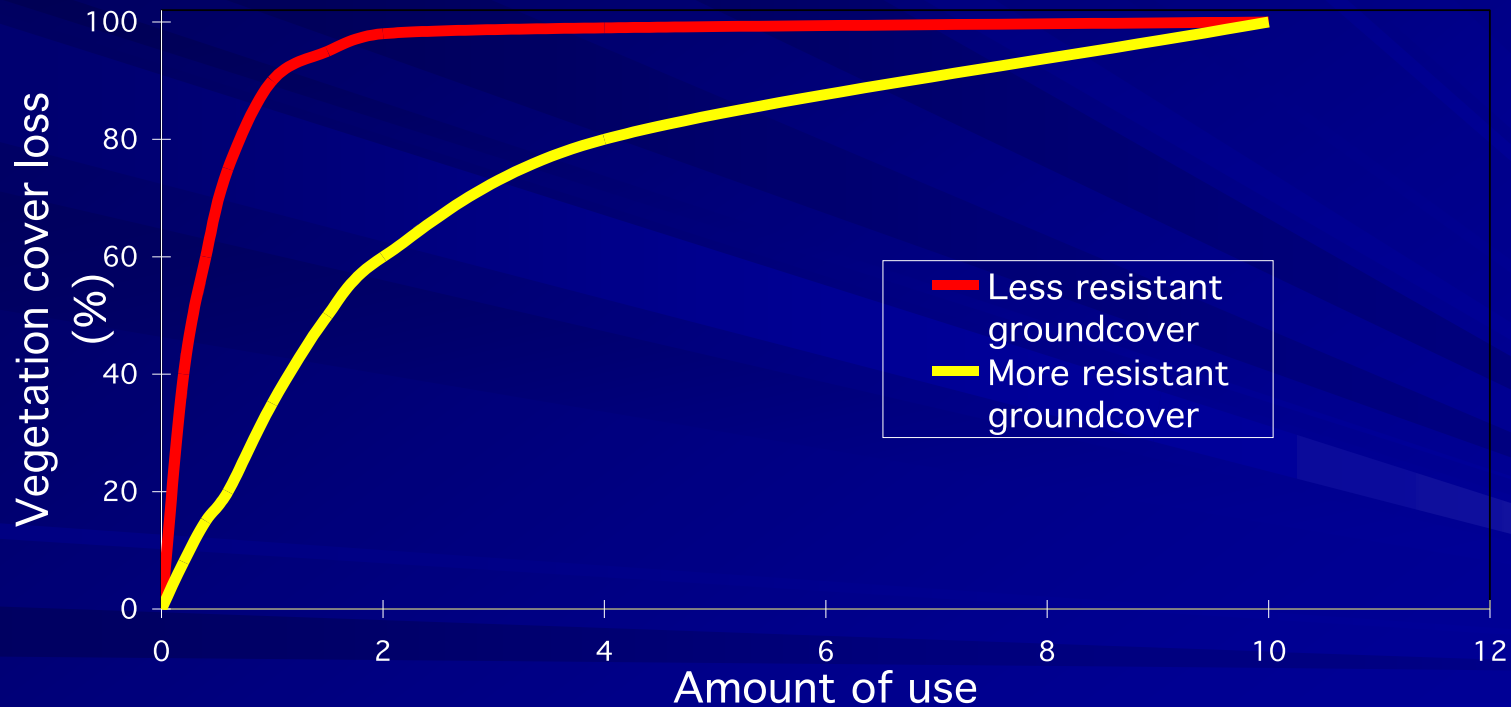
*Christopher Monz, Kelly Goonan Utah State University
Fritz Klasner, NPS Kenai Fjords National Park
Joel Cusick, Greg Daniels, NPS Alaska Region*

Sustainable Recreation Use

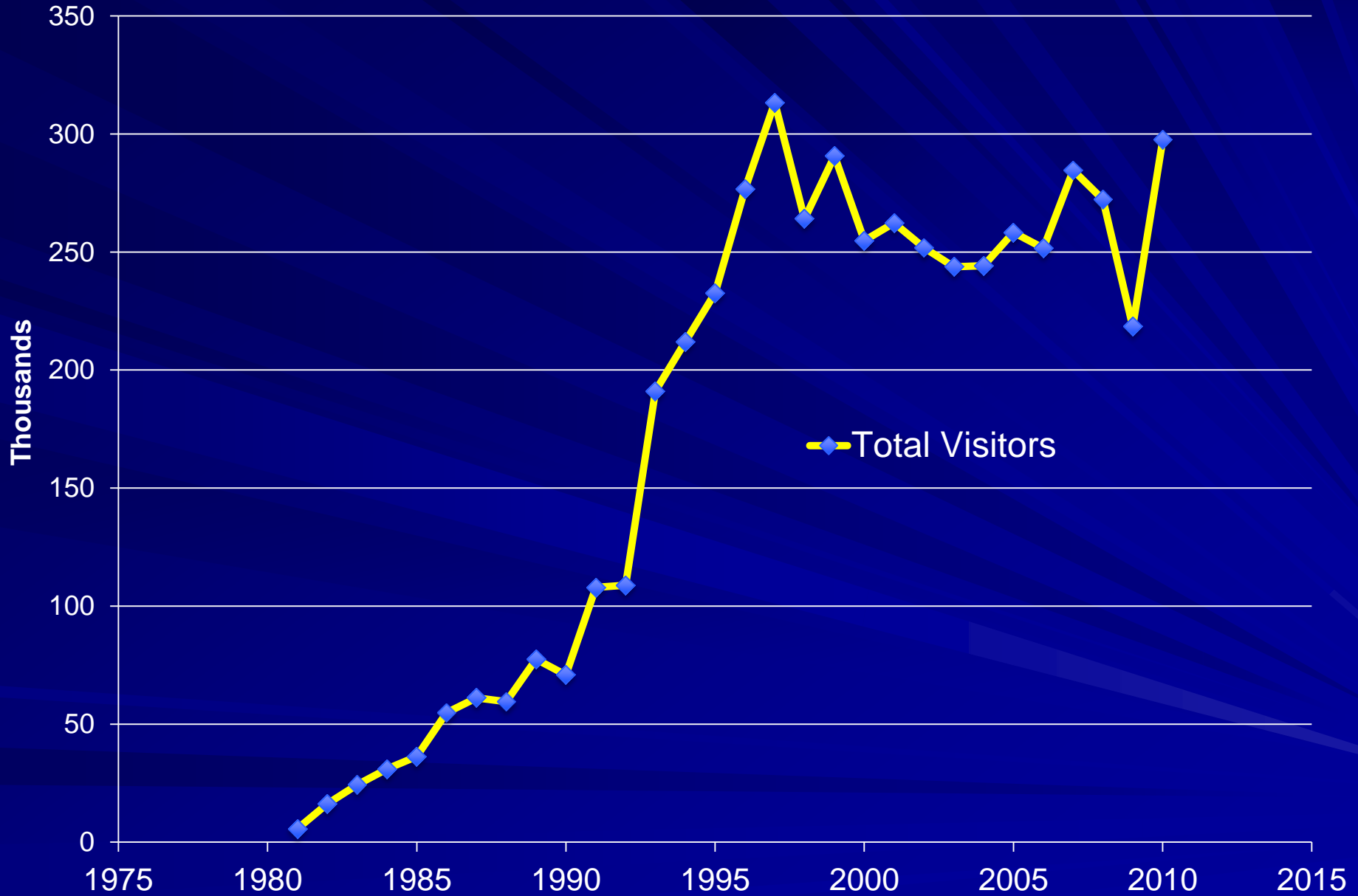


Recreation Ecology Fundamentals

General relationship between vegetation loss and use



Kenai Fjords National Park Annual Visitation



Today's Presentation

- Discuss capabilities of campsite inventory and monitoring
- Discuss process by which KEFJ's campsite monitoring approach was developed
- Discuss results of monitoring efforts and implications for future work

What Campsite Studies Can Do

- Inventory current resource conditions
- Track trends in conditions over time
- Act as a surrogate measure of visitor use patterns
- Evaluate the effectiveness of management actions
- Examine spatial aspects of use and resource change

What Campsite Studies Cannot Do

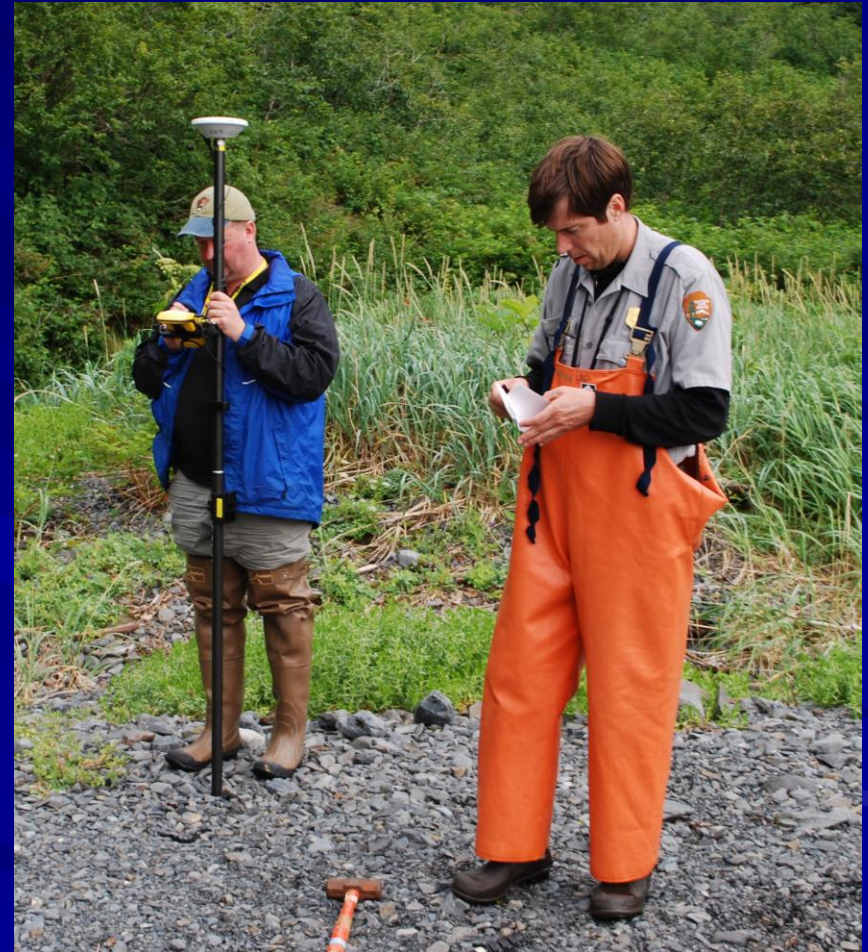
- Determine if observed conditions are sustainable ecologically (ecological thresholds)
- Determine if observed conditions are acceptable (Standards)
 - Managerially
 - Visitor Norms

Campsite Assessment in KEFJ

- Inventories began in late 1980's and assessments and protocol development continued for some time (M. Tetreau)
- 2006-2008 Meg Hahr continued to advance protocols
- August 2008 Campsite monitoring workshop at KEFJ
- Field testing of protocol and campsite assessments 2008 through 2010

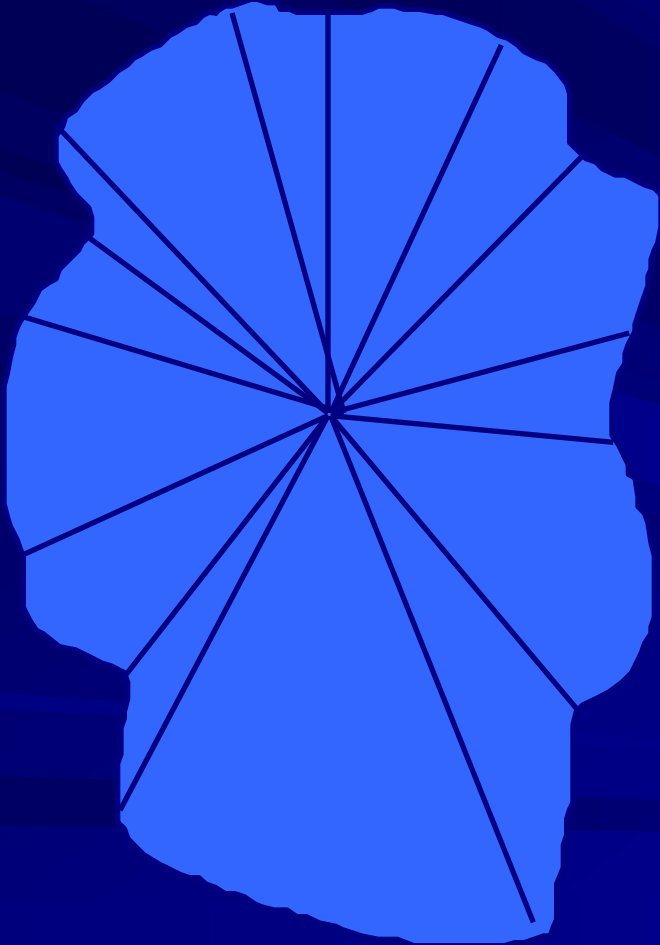
KEFJ Assessment Goals

- Two levels of assessment
 - Rapid
 - Full
- GPS based data collection
 - High accuracy
 - Simplifies data handling



Campsite Assessment Methodology

Variable Radial Transect Method



Inventory Parameters

- GPS Coordinates
- Substrate of campsite
- Distance to high tide
- Canopy cover

Impact Parameters

- Area of campsite
- Condition class
- Vegetation cover estimates
- Tree damage
- Mineral soil exposure
- Fire rings
- Human waste
- Photographic record
- Ghost Tree impacts

Resource issues





Summary of current (2010) campsite conditions in Kenai Fjords National Park. Values are means \pm SD for continuous measures and medians \pm range for ordinal measures.

<u>Site Attribute</u>	<u>KEFJ Study Area¹</u>
<u>Continuous Measures</u>	
Area of observable impact (m ²)	28.27 \pm 30.31
Condition class	2.4 \pm 1.0
Fire sites (#)	0.11 \pm 0.35
Informal trails (#)	2.27 \pm 1.32
Mineral soil exposure (%)	59.8 \pm 37.2
Stumps/cut shrubs (#)	0.11 \pm 0.5
Ghost stumps (#)	0.21 \pm 0.89
Vegetation cover loss (%)	55.7 \pm 39.5
<u>Ordinal Measures</u>	
Human waste	1 \pm 0
Litter/trash	1 \pm 2
Root exposure	1 \pm 2
Tree damage	1 \pm 1
Ghost tree damage	1 \pm 2

¹ N= 81

Frequency of Impact Concerns

<u>Impact Parameter</u>	<u>Frequency</u>
>Moderate tree/shrub damage	13
>Moderate root exposure	12
Cut tree stumps/ cut shrubs	4
Multiple trailing	59
Fire impacts observable	8
Significant presence of trash	0
Observable human waste	0
Campsites larger than 50 m ²	5

N=81

A comparison of selected resource condition parameters on KEFJ campsites in 2010 on differing substrates

Impact Parameter	Substrate Type ⁱ			ANOVA Results	
	<u>Organic Soil</u>	<u>Cobble</u>	<u>Sand</u>	<u>F</u>	<u>P</u>
Vegetation Cover Loss (%)	32.6	69.5	45.2	4.979	.010
CC	2.08	2.55	2.23	1.133	.329
Mineral Soil Exposure (%)	3.6 ^{a,b}	79.1 ^{a,c}	55.2 ^{b,c}	31.446	.000
Area of observable impact (m ²)	21.6	27.1	21.6	.686	.507
N	12	33	22		

ⁱ Values are means. Means followed by the same letter are significantly different with Scheffe's multiple comparison test at $P \leq .05$, DF=2.

Conclusions

- Campsites impacts are confined spatially although some beaches have multiple sites
- Multiple trailing is the most common resource change
- Sites compare favorably in average resource condition to other studies in coastal Alaska (Twardock and Monz 2010)
- Beach cobble areas show highest loss of vegetation and mineral soil exposure

Implications

- Baseline has been established to monitor extent and location of future changes in conditions
 - Efficient and well documented protocol
- Despite highest “impact,” areas of exposed beach gravel represent the most durable campsites
- Visitor education focusing on confining activities
 - Established gravel sites w/o beach vegetation
 - Minimize multiple trail formation

Thank You!

